



# Centerline

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An Environmental News Quarterly, From the NCDOT Natural Systems Unit

## Viewpoint

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I want to thank your editors for giving me the chance to write a small column about the reorganization that has placed the Project Development and Environmental Analysis Branch (PD &EA) under the Planning and Environment Division of NCDOT. When I arrived three years ago there were two "Planning and Environment" areas, and it confused everyone. Even with the renaming of the branch, I don't think people inside or outside of NCDOT ever understood that your branch wasn't part of the Planning and Environment Division. One benefit of this latest reorganization is that it has straightened out all the confusion, all the activities related to environmental planning are in one place at NCDOT.

Although I haven't been your supervisor for the last three years, I have certainly been involved in many of your issues and project discussions. My role in environmental policy required that I understand the problems we were facing and the improvements that we were making.

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## Abbott and Speight, a Tale of Two Streams

By: Clarence Coleman  
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The North Carolina Department of Transportation proposes to construct the NC 55, Holly Springs Bypass (TIP No. R-2541) on new location from Ralph Stevens Loop Road (SR 1114) to Bobbitt Road (SR 1448) in Wake County. After avoiding and minimizing impacts to the full extent practicable, it was determined that the construction of the Holly Springs Bypass will impact over 1700 linear feet of stream.

In order to mitigate for impacts to streams, NCDOT has begun the implementation of two stream restoration projects: the Abbott Property and Speight Branch in Wake County. The design of both projects was based upon the natural channel design methodology of Dave Rosgen.

Construction of the Abbott Property began in December 2000. The 5.5 acre site is located in the Roylene Acres Subdivision in west Raleigh. The project involves restoring approximately 1000 linear feet of stream, an unnamed tributary to Walnut Creek to a stable dimension, pattern, and profile. The stream had been degraded, resulting in degradation of water quality and loss of aquatic habitat both onsite and downstream. The main feature of the property prior to implementation was a 3.3 acre pond that had been drained. This type of restoration reestablishes the channel on a previous floodplain, which in this case is the basin of an old

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*View of Abbott Property*

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This background is going to be a tremendous benefit now that I am responsible for your area which includes the Natural Systems Unit. I have a reasonably good grounding in what you face on a day-to-day basis and, in my opinion, PD&EA has the toughest job in the department. First, your mission puts your focus on many of the non-traditional areas of transportation planning, so what you do is not always understood or appreciated by the rest of NCDOT or the external world. Second, your very job is to identify environmental and community issues and problems with the projects that have a lot of support internally and externally. This doesn't always make you popular when you do your job. Third, you are under the schedule gun from start to finish. Fourth, the laws, regulations and partners you must work with frequently have conflicting missions and goals that create the position of having to negotiate through a quagmire of conflict that sometimes ends up at a solution where no one is completely happy. All of that said, the work is critically important to the department and the state, and we need to help everyone understand its importance, as well as figure out how to make it work better.

I certainly don't need to tell you that anyone who supervises PD&EA becomes incredibly schedule driven. I understand that responsibility and accept it, but my personal values and goals also drive me to focus on improvement---improving the process, the organization and the relationships that are so key to making the Branch and the department as a whole successful. My vision for the future of the Planning and Environment Division is to deliver on our commitments and responsibilities so that NCDOT can provide needed transportation investments on time and within budget with maximum possible sensitivity to both the natural environment and the communities that they touch. There is no "given" in that statement---every part of it is ripe for improvements to be made. So, we will all be schedule driven because we must. However, don't be surprised when I ask for your help, your advice, and your time to make improvements in what we do and how we do it. As important as each and every transportation investment is, the long-term gift we can give to NCDOT and the state is making this process and the projects it produces better.

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### **Location, Location, Location: GPS Technology and the Natural Environment**

By: Chris Rivenbark  
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Approximately four years ago, NCDOT natural systems specialists began using the Global Positioning System (GPS) for the mapping of jurisdictional wetlands and streams. Until that time, wetlands and streams were delineated by staff biologists then surveyed by the NCDOT Locations & Surveys Unit. An increasing project load for the Locations & Surveys Unit as well as the need to provide wetland and stream mapping earlier in the development process lead to the Branch's decision to purchase their own GPS equipment. PD&EA staff have also used the GPS equipment to map locations of protected species, archaeological sites, and some historic properties.

Four mapping grade GPS units, manufactured by Trimble®, were purchased to meet the needs of the Branch. These units, with accuracies that fall between the range of true surveying GPS equipment and recreational grade equipment provide sub-meter accuracy. The receiver component of each unit is housed in a

backpack which connects to an antenna and data logger, or hand held portion of the unit. The receiver has the capability of receiving real-time data for a more accurate location mapping. The data logger functions as a small personal computer that allows the user to enter data about the area they are mapping in the field.

Recently, the Branch upgraded the data logger portion of the GPS units with the latest model by Trimble®. The new unit has additional capabilities that far surpass those of the earlier version. As common with today's recreational grade GPS units, the new data loggers provide the user with a picture showing the current location of the user as well as the location of any features that have been recorded. Possibly the greatest advantage of the newer units is the capability to import the design file for a road project directly into the data logger. This function allows the user to see exactly where an impact may occur in relation to features such as right-of-way boundaries, fill slopes, or culverts. By knowing the location of project limits in the field, users gather only the information they need, as opposed to not collecting enough data and having to return or collecting outside the project limits and spending additional unnecessary time.

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pond. Therefore, the Abbott Property is a Priority 1 restoration according to Rosgen methodology.

A diversion channel was constructed so that work on the stream could be done in the dry, which is standard for NCDOT stream restoration projects. Vegetation was planted adjacent to the stream to enhance the riparian buffer and to stabilize the banks.

Construction of Speight Branch commenced in January of this year. The Speight Branch site, 28.3 acres in size, is located in the northwestern quadrant of Holly Springs Road (SR 1152) and Swift Creek. Prior to implementation, Speight Branch had been channeled and exhibited unstable channel dimension, pattern, and profile, including eroded stream banks, and poor aquatic habitat. The project restores approximately 1400 linear feet of the stream to a stable dimension, pattern, and profile, while establishing downstream grade control to prevent further entrenchment at its confluence with Swift Creek. The restoration of Speight Branch is also a Priority 1 restoration.

Along with stream restoration, the Speight Branch project proposes to vegetatively and hydrologically enhance existing wetlands. The project also proposes to create additional wetlands by minor grading of upland areas adjacent to existing wetlands and allow for hydrologic connection with Speight Branch. Vegetative diversity and wetland function will be improved by the planting of hardwoods in the proposed enhanced and created wetlands. The total area of wetlands that will be enhanced and created is 8.3 acres.

Natural channel design grade control structures were installed on both the Abbott Property and Speight Branch. These structures include cross vanes, j-hook rock vanes, and root wads. Nearly all the stream work on both projects has been completed. Water is expected to be released into the newly restored channels for both projects soon.



## Hurricane Flood Recovery

By: Jay Johnson, Division 2  
Environmental Officer

*DEO Perspective: Featuring an article from a Division Environmental Officer. This quarter's segment is brought to us by Division 2, located in the Eastern reaches of the state.*

*"Most people who are reading this will probably be able to reflect on experiences or involvement in some area of emergency and recovery management."*

In Division 2 the destruction of Hurricanes Dennis and Floyd in the fall of 1999 can still be seen as repairs continue today. NCDOT Division 2 has logged more than 560 site repairs to roads, culverts, and bridges from the direct impact of the storms. My normal every day tasks of reviewing projects for permit compliance and performing preliminary environmental assessments of the secondary road improvement program were put on hold for over a year to focus on getting storm repairs properly permitted and documented so work could commence in a timely manner. This has been a huge learning curve for me, and anyone else that has been involved with this repair/recovery process. There are many Federal and State agencies involved, each having their own guidelines/conditions for environmental permitting and compliance. When repairs began initially a simple Nationwide permit from the United States Corps of Engineers (USCOE) would apply to most emergency and safety related repairs (excluding coastal counties) and no notification was required to perform the work. There was growing concern, confusion, and discussion among the agencies that what may be in compliance for one agency did not meet the permit conditions or notification guidelines of other agencies thus further causing more delays and ultimately causing FEMA to hold reimbursement funds.

This cloud may have a silver lining! There has been an ongoing effort among all the agencies headed up by the USCOE to create a general permit that could be accepted by all the agencies to allow storm-related repairs within a specified footprint to occur with minimal impacts, paper work, and notification procedures. In the future, when it all comes together, this type of permit could go a long way towards streamlining the emergency repair process for regulatory agencies, FEMA, and NCDOT.

# Improving the Environmental Permitting Process: An Interagency Initiative

By: Julie Hunkins

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The environmental permitting process associated with building and maintaining North Carolina's transportation system is lengthy and highly complex, involving many state and federal agencies. In an effort to improve the workflow effectiveness and efficiency of the environmental permit development, coordination, and issuance process, the NC Department of Transportation (NCDOT), the NC Department of Environment and Natural Resources (DENR), and the US Army Corps of Engineers (COE) are jointly sponsoring a process improvement initiative. The initiative was undertaken with the primary purpose of developing quality permit applications and issuing environmental permits that support the timely delivery of the transportation program while minimizing disruption to the natural and human environment.

Team members include experts from the DENR's Division of Water Quality, Division of Coastal Management, and Wetlands Restoration Unit and the COE's Regulatory Branch. Staff from NCDOT's Natural Systems Unit, Project Development, Design Branch, Hydraulics Unit, and Operations round out this diverse, interdisciplinary team.

The team met for an intensive one-week, facilitated workshop to analyze the current permitting process, identify the trouble spots and redesign the process to eliminate major problems, including re-work at late stages in the project development process. Through group discussions, the team gained in-depth knowledge of the current permitting process and the role each agency plays in the process. A process map was developed showing the dependent relationship between the environmental permitting, project development, design and mitigation processes. After identifying and analyzing the problems associated with the current process, the team redesigned the process to address concerns that had been identified.

It was no surprise to the team that the challenges associated with permitting occur in the very early stages in systems planning when alternatives are first considered – when the opportunity to avoid and minimize wetlands is greatest. (Demonstrating avoidance and minimization are the first, and essential, steps for permit issuance.) Therefore, the team considered the early planning stages, project programming and project development -- parts of the process not traditionally thought of as “the permitting process” -- as potential areas for improvement.

The anticipated benefits of the new process include a shorter overall permitting process, potential cost savings and improved predictability on when projects can proceed to the construction phase. Specifically, the team hopes to achieve a 2-year overall

reduction in time to develop, coordinate and issue permits, as well as a nine-month reduction in the overall time it takes to plan and prepare a project for construction. (The current process takes as many as 10 or more years for a highly complex project). Other improvements will be achieved by beginning mitigation planning earlier in the project development process, making bridging decisions early where high quality resources are present, coordinating hydraulic design with resource agencies in advance of right-of-way acquisition and significantly reducing the amount of re-work that occurs throughout the process.

Early and continuous coordination during project development were integrated into the redesigned process to more effectively and efficiently address the following critical issues associated with the permitting process: purpose and need, range of alternatives to be studied, avoidance and minimization of wetlands and wetland and stream mitigation.

The associated implementation plan consists of 30 individual projects that are needed to employ the newly designed process. The recommendations fall into general categories and include: project programming, project development and NEPA compliance, legislation and regulations and applications/permits. Many of the specific recommendations relate to improved communication, technology enhancements and training and education.

Measurement criteria that will be used to track the success of new process implementation include:

- Average cycle time from permit application to formal approval
- Percent of projects with permits delivered on schedule
- Timely submission of information by NCDOT
- Percent of applications placed on hold by permitting agencies
- Average time that permits are received prior to the project letting
- Percent of permit applications submitted with the final approved mitigation plan
- Number of permit modifications

This initial planning phase for improving the permitting process is just the first step on a long journey -- the biggest challenge lies ahead in implementation. With the full support of the agencies engaged in this initiative, the State of North Carolina will greatly benefit from a streamlined process that will result in the timely delivery of transportation projects with better environmental protection.





## Project Spotlight: R-2000, The Raleigh Motor Speedway...er, I mean the I-540 Outer Loop

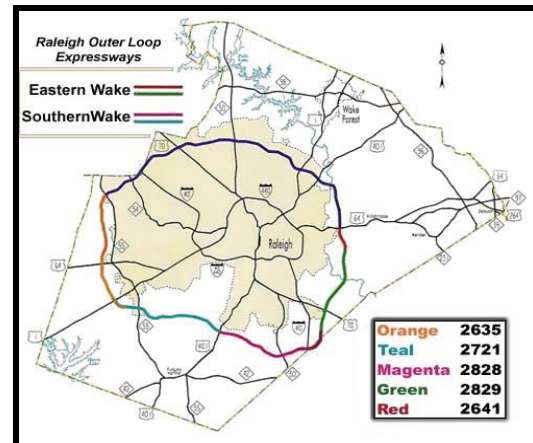
By: Alice Gordon

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The Northern Wake Expressway is a 30 mile controlled-access, four to six lane, divided highway on new location that, when finished, will route traffic around the city of Raleigh, North Carolina. The road is an outer loop and is designated at I-540. Planning for the project began in the 1980s with the establishment of a corridor of land that was protected from development by the municipal and state governments. The environmental analysis of the project was started in the 1980s and on September 10, 1990 the Final Environmental Impact Statement was signed by the Federal Highway Administration (FHWA). We decided to build the project in sections and named the sections R-2000A, B, C, D, E, F, and G. Several sections have been built (B, C, and D); others are in construction (EA and EB); and Sections F, G, and A are scheduled for construction in 2002 and 2003.

During the planning and design of the project we evaluated the environmental characteristics of the corridor. The project affects approximately 59 acres of wetlands and 21,326 linear feet of jurisdictional streams. Impacts to wetlands were mitigated with a combination of on-site and off-site mitigation consisting of wetland restoration, enhancement, and preservation. All of the off-site mitigation was done in the same Hydrological Cataloguing Unit (USGS) as the impacts. We have, or plan to, mitigate with approximately 53 acres of wetland restoration, 6.7 acres of creation, 76 acres of enhancement and 94 acres of preservation. To date, we have implemented 20 acres of restoration, 6.7 creation, 73 acres of enhancement and 53 of preservation. Our stream mitigation is being done by payment to the North Carolina Wetland Restoration Program (WRP).

The proposed Expressway lies primarily within the Neuse River Drainage Basin, with a relatively small percentage falling within the Cape Fear River Drainage Basin. Therefore, we are subject to the Neuse River Basin Riparian Rules (15A NCAC 2B .0233). These rules, adopted December 1999, require the protection of a 50-foot wide buffer on both sides of waterways in the Neuse River Basin. We will be affecting these buffers and will make payment to the WRP to



mitigate for these impacts to Section F, G and those sections of A in the Neuse River Basin.

The project has received the necessary environmental permits from the United States Corps of Engineers (USACE) and the North Carolina Division of Water Quality (DWQ) in stages. The first section to be built was Section B that connected I-40 to US 70 and provided a new improved access to the Raleigh-Durham International (RDU) Airport. Section B has independent utility, received the Section 404 and 401 (of the Federal Clean Water Act) permit from the USACE in 1992. The project was completed in 1998. In March 1996 a permit application was submitted for the remaining sections of the project and the permits were issued in October 1996. The permit application included final plans for sections CA, CB, and D and preliminary plans for Sections E, F, G, and A. Also the March 1996 application provided mitigation for only Section CA. When the permit was issued it contained 31 Special Conditions and many of these conditions addressed mitigation. For instance, we were required to have mitigation plans approved for Sections CB and D before construction could begin. Another condition required that we have mitigation sites approved, constructed, and planted before construction on Sections E, F, G, and A can start. Hopefully, the remaining portions of R-2000 will be completed expeditiously, and when done so, the growing traffic congestion will be alleviated.

## NC DOT in the Buffers

By: Michael Wood

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North Carolina has recently enacted regulations affecting riparian buffers in certain areas of the state. A riparian buffer is the natural area immediately adjacent to a body of water. Some of the buffers invaluable functions are that it provides a unique ability to slow erosion and absorb nutrients, buffering the amount of non-point discharge of pollutants into the water.

These rules were adopted for the Neuse River Basin, since June 27, 1997; and the Tar-Pamlico River Basin since January 1, 2000; and are proposed as temporary rules for a portion of the Catawba River Basin, in June of 2001. They fundamentally state that a riparian buffer of 50 feet, consisting of two zones, must be maintained adjacent to all surface water features. Zone one, the area closest to the water, is the "wooded" zone, and extends 30 feet out from the edge of feature. Zone two extends for another 20 feet, and is the "vegetative" zone.

The areas targeted by the buffer rules are any surface water or feature that is approximately shown on either the most recent Natural Resource Conservation Service (NRCS) soil survey map, or United States Geological Service (USGS) topographical map. The NRCS is usually more inclusive, and thus more strict. If it's not on either of the maps then the impacts to the buffers do not have to be considered.

The impacts fall into four categories,

exempt, allowable, allowable with mitigation, and prohibited. Typical activities representative of each category would be; stream restoration as an exempt activity, a road crossing as allowable or allowable with mitigation, and installation of an on-site septic system as prohibited. For allowable or allowable with mitigation activities, the Division of Water Quality (DWQ) has 60 days to decide if the activity will be authorized and must then provide written concurrence before the project can continue.

The NC DOT will conduct activities that will most often fall into either the allowable or allowable with mitigation category. For perpendicular road crossings of surface waters, mitigation is required when a project impacts over 150 linear feet of stream or over 1/3 of an acre at any particular site while any non-perpendicular impact requires mitigation regardless of the size of the impact. The Rules are designed to promote the avoidance and minimization practices observed in dealing with other natural resources, such as wetlands, and to promote the best practical alternative, such as bridging as opposed to culverts.

It will take a lot of time and effort in the beginning stages on the sides of both the DOT and the DWQ; however, as the process becomes routine, it should run as smoothly as the rest of the branch's tasks.

### T&E Box Score

By: Michael Wood



*"In the sports section of most newspapers, there are the baseball box scores, short, statistical lists recapping the previous games. We introduce our version, recapping the significant discoveries, by our staff, of species in North Carolina.*

*This issue covers occurrences for the year 2000."*

<u>Name</u>	<u>Species</u>	<u>Location</u>	<u>Occurrences</u>	<u>Category</u>
Four toed salamander	<i>Hemidactylium scutatum</i>	Wake	2	Amphibian
Orange-fin madtom	<i>Noturus gilberti</i>	Stokes	1	Fish
Least Brook Lamprey	<i>Lamptera aepyptera</i>	Wake	1	Lamprey
Dwarf-wedge mussel	<i>Alasmodonta heterodon</i>	Franklin	1	Mussel
Appalachian elktoe	<i>Alasmodonta raveneliana</i>	Transylvania	1	Mussel
Creeper*	<i>Strophitus undulatus</i>	Transylvania	1	Mussel
Tennessee clubshell*	<i>Pleurobema oviforme</i>	Transylvania	1	Mussel
Long-solid*	<i>Fusconaia subrotunda</i>	Transylvania	1	Mussel
Dwarf-wedge mussel	<i>Alasmodonta heterodon</i>	Warren	1	Mussel
Atlantic pigtoe	<i>Fusconaia masoni</i>	Randolph	1	Mussel
Eastern lampmussel	<i>Lampsilis radiata</i>	Wake	1	Mussel
Triangle floater	<i>Alasmodonta undulata</i>	Wake	1	Mussel
Squawfoot	<i>Strophitus undulatus</i>	Wake	1	Mussel
Savannah lilliput*	<i>Toxolasma pullus</i>	Randolph	1	Vascular plant
Dwarf-flower heartleaf	<i>Hexastylis naniflora</i>	Cleveland	1	Vascular plant
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	Mecklenberg	1	Vascular plant
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	Union	1	Vascular plant

\* New County Record

## Fourth National Mitigation Banking Conference

By: David Schiller  
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PD&EA staff member Dave Schiller attended the 4<sup>th</sup> National Mitigation Banking Conference on April 19-20, 2001. The conference, held in Ft. Lauderdale, Florida, brought together mitigation bankers, regulatory and resource agency personnel, and researchers to hear presentations on a broad array of issues related to wetland and stream mitigation banking. Approximately 160 people from 31 states, the District of Columbia, and three foreign countries (including Australia and Japan) attended. The conference had a strong North Carolina flavor, with nine people from the state in attendance. Members of the Tar Heel delegation chaired several of the sessions, and Congressman Walter B Jones III, from the Third Congressional District of North Carolina, presented the keynote address.

Dave Schiller presented an overview of the NCDOT mitigation program during a session that included a similar presentation about the South Carolina Department of Transportation's program. The NCDOT program includes a three-phased approach for providing compensatory mitigation. These are the in-house program, payment into an in-lieu fee program, and purchase of mitigation credits from the private sector. In contrast, the South Carolina mitigation program is based on a series of mitigation banks developed by the SCDOT throughout the state. No private credits are purchased.

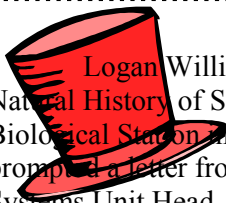
The "business" of mitigation banking is more developed in Florida than in most other parts of the country. Over 25,000 acres are currently in approved private banks, some as large as 3,000 acres. The Florida Department of Transportation has purchased some of the privately banked credits.

With the rapid growth of urban areas in south Florida's coastal regions, the majority of credit sales are to the private sector. In the northeast, the focus of mitigation banking is located in the Hackensack Meadows of New Jersey. In these and several other areas, approved credits are available for purchase by private developers and public agencies.

Two issues generated the greatest amount of discussion and controversy throughout the conference. These were the use of in-lieu fee programs and the implementation of on-site mitigation verses off-site mitigation by private banks. In-lieu fee programs were criticized by some as not effectively offsetting impacts to wetland resources. An example given was the permitted impact to several acres of wetlands in a Midwestern state after the developer paid into a fund to provide environmental education.

The issue of on-site verses off-site mitigation generated an academic discussion of replacement of functions and values. There was general disagreement about the use of small, "postage stamp" sized mitigation sites located near the impacts being as effective as large, contiguous mitigation sites located further away. Those favoring on-site mitigation generally included the resource organizations while private bankers supported the use of off-site mitigation (including banks). It appears that this debate will be determined on a case by case basis at the local level by regulatory agencies during the permit application process.

The conference will be held in San Diego in 2002 and there was informal talk that it may be held in Wilmington, NC, the following year.



### Hat's Off to Logan

Logan Williams recently participated in a workshop dealing with the "Taxonomy and Natural History of Southern Appalachian Mayflies, Stoneflies, and Caddishflies" at Highlands Biological Station in Western North Carolina. Logan received an "excellent rating" for course that prompted a letter from Dr. John C. Morse, Clemson University, to Dr. Charles Bruton, Natural Systems Unit Head, commending Logan's efforts.

Dr. Morse wrote, "I commend you for attracting and encouraging such an outstanding employee.... You can be assured that he contributed significantly to maintaining your Department's excellent reputation and deserves any inducement at your disposal to keep him in it."

### Hat's Off to Gordon

Gordon Cashin, Natural System's Bio-Team Leader, has achieved the Certified Manager designation from the Institute of Certified Professional Managers. The Certified Manager designation identifies those who have met educational and experience requirement and successfully passed a comprehensive exam covering managerial theories and applications.

## NCDOT to Improve Planning Process Using DCM's Wetland Data

By: Jim Stanfill and Kelly Williams, Division of Coastal Management Wetland Specialists

*Invited Article: Featuring Articles from Other Units that Relate to Natural Systems.*

The NCDOT is working with the NC Division of Coastal Management (DCM) to incorporate DCM's Geographic Information Systems (GIS) wetland data into the transportation planning process. NCDOT can improve wetland avoidance, minimization, alternatives analysis, impact assessment, and mitigation site searches. DCM has spent ten years developing some of the best wetland mapping datasets in the country. So far DCM has developed four wetland inventory and assessment tools for the coastal area; Wetland Type Data, Wetland Functional Significance Data (NC-CREWS), Potential Wetland Restoration and Enhancement Site Data, and Restoration and Enhancement Functional Assessment Data (R-FAP).

DCM's Wetland Type data inventories the type, amount, and location of existing wetlands in 40 Coastal Plain counties. The Wetland Type maps were developed using the NRCS soil surveys, USGS 1:24K Hydrology data, National Wetland Inventory (NWI) maps, 1989 and 1994 Landsat TM satellite imagery, and extensive field reconnaissance data. The resulting maps have received national attention for their accuracy, ease of use, and comprehensiveness.

Although knowing the location of wetlands can be helpful, knowing the ecological significance of those wetlands can minimize impacts to high quality systems. DCM's Wetland Functional Significance data rates the relative ecological significance of wetlands by assessing their potential to perform water quality, hydrologic, and wildlife habitat functions.

The GIS-based model that is used to calculate these ratings is known as the North Carolina Coastal Region Evaluation of Wetland Significance or NC-CREWS. NC-CREWS was developed by DCM and eight other state and federal agencies. NC-CREWS measures 3 major wetland functions (Hydrology, Water Quality and Wildlife Habitat), 7 wetland subfunctions and 39 landscape and wetland parameters. Wetlands are assigned ratings of Beneficial, Substantial or Exceptional Significance, depending on how well they perform the various wetland functions.

DCM's Potential Wetland Restoration and Enhancement Site maps and the DCM's Restoration Functional Significance maps should enhance NCDOT's mitigation site search efforts. The Restoration and Enhancement Site maps show areas

that used to support wetlands and areas that support degraded wetlands. The sites are classified by disturbance type and by the type of wetland they are likely to support based on soil type, landscape position, hydrology, surrounding wetlands, and field investigations. This data is available for 20 coastal counties and are nearly complete for 20 additional inner Coastal Plain coastal counties.

The Restoration Functional Significance maps were developed using another GIS model called the Restoration Functional Assessment Program (R-FAP). The R-FAP, like NC-CREWS, evaluates each restoration or enhancement site and assigns a rating of Beneficial, Substantial or Exceptional Significance, depending on how well they would perform the various wetland functions if restored or enhanced.

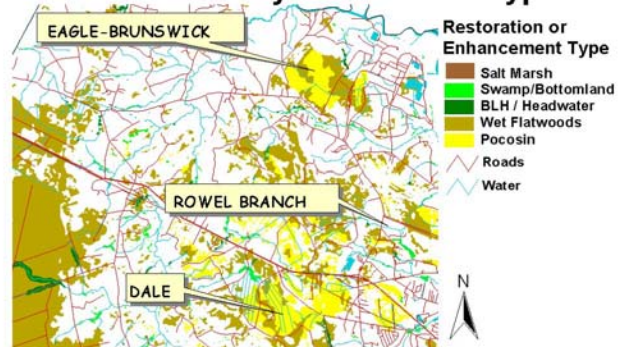
These datasets have many potential uses in transportation planning and wetland mitigation. The wetland type data can be used early in the transportation process to avoid and minimize impacts to wetlands and specific wetland types and to estimate project impacts and estimate mitigation needs. The NC-CREWS data can be used to refine a road alignment to avoid the most ecologically significant wetlands that contribute most to their watershed's health. Potential restoration site data and the R-FAP can be used to locate mitigation sites and evaluate their ability to compensate for unavoidable wetland impacts.

For more information contact DCM's wetland specialists in DCM's Raleigh Office.

Phone: (919) 733-2293

Toll-free: 1-888-4RCOAST

### Brunswick County Restoration Types





## Essential Fish Habitat Protocols

By: Phil Harris, P.E.  
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In April 2000, the National Marine Fisheries Service (NMFS) gave a presentation to members of the Federal Highway Administration (FHWA) and the North Carolina Department of Transportation (NCDOT). The purpose of the presentation was to alert the department that Essential Fish Habitat (EFH) was a significant issue and it needed to be addressed by the department as part of its natural resource field investigations for all transportation projects. The Magnuson-Stevens Fishery Conservation and Management Act was first introduced in 1996 and included the EFH guidance. This guidance has since been amended and the EFH interim final rules were adopted in 1997.

*What is Essential Fish Habitat and what is its significance in relation to transportation projects?*

Essential Fish Habitat defines those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity. As it pertains to North Carolina, the EFH areas of significance are the 20 coastal counties recognized by the Coastal Area Management Act (CAMA). Within these 20 counties, the National Marine Fisheries Service has made available a water body index to better clarify those significant waters. In situations where these waters are threatened by highway projects, the department has been given authority by the FHWA to carry out an EFH

investigation when applicable. The key to this investigation is coordination with the National Marine Fisheries Service. This agency provides clarification and provides answers to those situations where impacts or jurisdictional intrusion is questionable.

In cases where it appears an EFH assessment is necessary, NCDOT coordinates with the NMFS and makes a site visit to examine habitat. If it appears habitat is present, the Natural Systems Specialist follows a format developed by the NMFS in describing EFH impacts and possible mitigation strategies. This documentation is included as part of the Natural Resources Technical Report. Close coordination with NMFS is recommended when discussing mitigation options. Depending on the environmental document type, the NMFS comments during the draft document stage for Categorical Exclusion (CE) and during all other agency review time for the larger Environmental Assessment and Environmental Impact Statement.

Any questions or clarification on Essential Fish Habitat rules can best be addressed by Mr. Ron Sechler at the National Marine Fisheries Service Office in Beaufort, North Carolina. His e-mail address is as follows: [Ron.Sechler@noaa.gov](mailto:Ron.Sechler@noaa.gov)

## DETOURS

A wildlife biologist, an engineer, a construction foreman, a certified manager, and a Forestry specialist come home after a fishing trip, and are asked about their luck.

The wildlife biologist said, "these four amateurs brought me nothing but bad luck." The engineer says "there isn't any luck, using a modified ellipse equation, I simply calculated the angle at which the lure should hit the water to best attract the fish and caught about half a dozen."

The construction foreman said, "Luck, there's no such thing as luck, I sent a slight electrical pulse to stimulate a response from the fish, and ended up catching about a dozen."

The Forestry specialist answered, "What Luck? I simply used some catalpa worms, from the Catalpa bignoniodes, and the fish came to it like pine beetles on a loblolly. I caught about 18." The Certified manager answered, "I don't believe in luck. After extrapolating the ideal catch, I used the appropriate multi-gig rigging to optimize catch per unit of effort, and quit after 24." The wildlife biologist replied, "These four brought me nothing but bad luck."

Now, check the picture, and figure out who's lucky and who wasn't...



## Working for NCDOT — One Biologist's Perspective

By: Sue Brady

*Sue recently moved to the state of Washington with her husband Shawn Cain. She joined NCDOT in the Fall of 1998 and provided outstanding service and expertise to the Natural Systems Unit. She is currently providing consultant services to our staff.*

The North Carolina Department of Transportation (NCDOT) has a stated commitment to “protect and improve the state’s natural



resources.” The Project Development and Environmental Analysis Branch (PD&EA) plays a large part in realizing this goal, through its work with other branches of the Department during the design phase and coordination with the resource agencies, as well as examining mitigation options and implementation. As a biologist working in PD&EA, I felt that I was having an impact, helping ensure that project impacts were minimized as much as possible and that the appropriate regulations were applied to protect wetlands and streams.

There is, however, a peculiar ambivalence in being an environmental biologist working for the

Department of Transportation. On one hand, the job could be frustrating. Sometimes during a project survey (especially for projects on new location), I’d be excited to explore a beautiful, diverse habitat, with lots of cool critters to look at, then remember that the area is scheduled for development. My training is in biology and ecology, so I naturally enjoy and value undisturbed habitats.

On the other hand, however, I did feel that I was having a positive impact on the environmental planning process, and playing an important part in protecting the environment, by working “from the inside.” We in PD&EA have as much right to be called environmentalists as the most radical tree-huggers, because we are entrusted by the people of North Carolina to help protect the environment of the state, while still recognizing the fact that North Carolina is a growing state and has growing transportation needs. It’s a delicate balance, just like any other ecosystem.

### Natural Systems Unit Receives Award from Consulting Engineers Council of North Carolina

The Natural Systems Unit was recognized by the Consulting Engineers Council of North Carolina at their annual Public Sector Client Recognition Banquet held April 10, 2001 at Tanglewood Park in Clemmons. Arcadis Geraghty & Miller nominated the Natural Systems unit for the award. Phil Harris was present to accept the award on behalf of the unit.

The awards are based on the following six criteria:

Did the client use a qualifications-based selection process?

Did the client negotiate fair contract terms with the member firm?

Do the client and member firm have a formal or informal partnering relationship? Is there excellent communication and rapport between the two parties?

Is the client knowledgeable about the engineering aspects of the project? Does the client respect the opinions of the member firm?

Does the client pay invoices according to terms of the contract?

For design projects, does the client adequately involve the member firm in the construction phase so that the member firm can follow through with its design?

The Natural Systems Unit ranked highly in all categories. In accepting the award Harris commented that the Unit views the private firms under the limited services agreement as an extension of the Natural Systems Unit.



Pictured above are Beth Harmon and Phil Harris, critical coordinators for consultant oversight of Natural Systems Contracts.

## Employee Spotlight and Personnel Update

By: Staff

Bruce O. Ellis is originally from Gladstone New Jersey. He received a Bachelor of Science Degree in Agriculture/Environmental Science from Rutgers University's College of Agriculture and Environmental Science in 1973. Bruce began his career in the private sector where he was involved with aquatic resource management and natural resources in the Mid-Atlantic and New England states from 1973 through 1995. Mr. Ellis holds certifications as a Certified Lake Manager and Professional Wetland Scientist.

Bruce joined the NCDOT Natural Systems Unit in 1995 as an Environmental Specialist. In 2000, Bruce accepted a position of a Bio-Team Unit Head. As a Unit Head, Bruce oversees his staff in their natural resources, permitting, and mitigation projects. In addition to his leadership duties, Bruce also has mitigation and permit projects of his own. His office can convert from a manager's workspace to a biological lab on a daily basis. Bruce's expertise in Submersed-Aquatic Vegetation (SAV), and benthic macro invertebrates, necessitates a workload of aquatic surveying and monitoring.

Bruce's other full time job is being a father to his two sons, Luke and Matthew and a husband to his wife, Catherine. He is currently a Webelos Scout leader and participates in other organizations beneficial to the community.

### Bruce O. Ellis



### Clarence W. Coleman



Clarence Coleman, Natural Systems Engineer, is a native of Freeman, Virginia. Clarence graduated from North Carolina State University with a Civil Engineering degree in December 1991. He is registered as a Professional Engineer in North Carolina and Virginia.

He began working for NCDOT in January 1992 as a Transportation Engineering Associate. Clarence joined the staff of PDEA as a Project Development Engineer in July 1993. As a Project Development Engineer, Clarence conducted various types of transportation planning studies throughout North Carolina.

In February 1999, Clarence was promoted to Natural Systems Engineer where his primary duties include administering all stages of NCDOT mitigation projects, including work done by private engineering firms. He is currently managing the Croatan project, a 4,100 acre bank that will be established by NCDOT. Clarence is also responsible for several stream restoration and wetland mitigation sites.

On the community level, Clarence volunteers as an assistant basketball coach at Southeast Raleigh High School, and as head coach of the Garner Road YMCA 10 and Under boys basketball team. He resides in Raleigh with his wife, Janine. They have two children: Justin, age 6, and Jada, age 3.

#### Hello to Rachelle Beauregard

We welcome Rachelle Beauregard to the Natural Systems Unit. Rachelle is a NC State University Fisheries and Wildlife Science Graduate. She brings with her, 3 years of experience, including endangered species work, from employment with a consulting firm. She is a member of the Ellis Bio-Team.

#### Farewell to Shannon Simpson

Shannon left the Natural Systems Unit in June 2001, after 3 years of service, in pursuit of additional education. She will be attending the College of Charleston to earn her masters degree and will be working for a consulting firm in Charleston, SC. Good Luck Shannon-We will miss you!

**Detour Answer:** All in the picture caught fish: Forestry Specialist = Jeff Burleson, Wildlife Biologist = Hal Bain, Certified Manager = Gordon Cashin, Engineer = Phil Harris, and the Construction Foreman = Bill Paugh. The unlucky one was taking the picture (LeiLani Paugh, Natural Systems Specialist).

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### Our Mission Statement

Each of the teams in the Natural Systems Unit is responsible for natural resource investigations, obtaining environmental permits, developing wetland and stream mitigation plans, and implementing the construction of mitigation sites.

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